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Executive Summary

This report is written to analyse the current trends, areas of profitability and aims to provide recommendations to the strategic direction of Office Suppliers (OS) in North America. By understanding the patterns in consumer behaviour through in depth analysis of our sales numbers, these findings will allow us to recommend appropriate strategies to further the growth of the company.

The analysis consists of descriptive, trend, what-if and profit analysis for OS's products across the years 2012 to 2015. Figures from 2016 were excluded as the data only contained figures from the month of January. Hence including these figures may result in an inaccurate analysis for cumulative profit, sales and quantity sold. We also used ship date instead of the order date as the basis for our analysis, since we assumed that the title for all products were passed from OS to the customer on the shipping date. All graphs were created using Tableau or Microsoft Excel.

In general, it appears that OS has performed well throughout the years, with an increasing trend in their total profits throughout the years. In 2015, the total profit was $98,698.61, which was an increase of 98.16% from 2012 (Figure 8). However, analysis of the profit ratio showed a decrease in OS's profit ratio from 0.14010 in 2014 to 0.13040 in 2015 (Figure 18), indicating that a lower proportion of sales was converted to profit. Figure 19 explains that a possible reason may be the large increase in shipping costs, which is a factor that our team will take into consideration in our following recommendations.

At the market segment level, the Consumer segment had the highest profits for all years, followed by the Corporate, the Home Office segments (Figure 21). At the subcategory level, Tables, Bookcases and Supplies generated negative cumulative profit while the other 14 subcategories generated positive profit. Copiers generated the highest cumulative profit of $58,281.46 (Figure 4). In terms of quantity sold, Binders is the most popular, while Copiers is the least popular product(Figure 8). In terms of sales, Phones generated the highest cumulative sales over the 4 years, while Fasteners had the lowest sales (Figure 9).

Lastly, based on an analysis of the cumulative profits across all states, we observe that 10 states - Oregon, Florida, Arizona, Tennessee, Colorado, North Carolina, Illinois, Pennsylvania, Ohio and Texas - generated negative profits (Figure 6). In particular, the revenue loss in Texas was the highest, at $25,603.49.

From the analysis, the team has come up with the top three recommendations for OS.

Recommendation 1 (Cutting Expenses):

In order to attain their goal of maximising profits, OS needs to cut down on their losses, mainly by cutting their expenses. To do so, the team recommends discontinuing the sale of Tables, Bookcases and Supplies. These 3 subcategories were the only ones to generate negative profits (Figure 3). In particular, despite having one of the highest sales, Table still generated revenue losses (Figure 19), which implies that the costs of production of Tables is way too high, thus offsetting all the gains from sales. Hence, discontinuing the 3 subcategories can reduce costs of production, and in turn increase profit by 6.75% (Figure 15).

Furthermore, the team also recommends temporarily stopping sales to the 10 states that produced negative profits, namely Oregon, Florida, Arizona, Tennessee, Colorado, North Carolina, Illinois, Pennsylvania, Ohio and Texas. This can possibly reduce shipping costs by 30.7%, which in turn lowers expenses(Figure 7). This is extremely crucial as based on our analysis in Figure 18, a plausible reason for the decrease in profit margin from 2014 to 2015 is the large increase in shipping costs. In general, the Figure also shows that shipping costs have been rising higher and higher each year. Thus it is very worthwhile for OS to stop the shipping of goods to the 10 states either permanently or for the time being, until they can find ways to reduce their shipping costs. In the meantime, OS can focus on shipping to states which are more likely to generate higher profits.

Recommendation 2 (Targeted Marketing Strategies):

The analysis in Figure 21 shows that the Consumer market segment is the most profitable every year, as the population of individual consumers is much larger compared to the number of corporations and home offices. Consumers are also more likely to be influenced by advertising as they do not have a fixed limit of products that they can buy, since they are purchasing for personal usage. Hence OS can consider focusing their marketing strategies on consumers. The team has come up with several possible marketing strategies to increase customer engagement.

Firstly, OS can revamp their websites to create a more personalised shopping experience for their customers. For example, when a customer places something in his/her cart, the website can recommend other products that are usually bought along with that product. If the customer buys a computer, the websites can recommend computer accessories such as wireless computer mice, flash drives or keyboard covers. Additionally, the websites should also feature updated best-selling "Hot New Products" on their home page, in order to guide customers who may be visiting the website for the first time, as well as pique the interest of existing customers. This is extremely useful for businesses like OS which sell a wide range of products.

Furthermore, OS can work on expanding their brands' digital presence through online marketing. 62 percent of businesses use Youtube as a channel to post video content. Facebook and Youtube are the top two most commonly used channels for businesses to post content (Buffer, 2019). Thus OS can make use of these channels to post video demonstrations of how their products can be used in real life, and showcase how the products are superior in terms of usage and functionality. OS can also invest in video advertisements to reach a large group of consumers.

Lastly, 37% of American adults also use Instagram (Hootsuite,2019). Hence, OS can market their products on Instagram by sharing captivating images of the best-selling products, new products, notices about sales discounts and even Gift Guides. For example, during the Christmas/Thanksgiving festive season in December, many consumers will be interested in holiday gift ideas for their co-workers, or they may be looking for cheaper Paper and Art supplies to write their Christmas cards (Figure 16). Therefore OS can promote holiday season sales discounts or market their products as "the perfect gift" on Instagram.

All of the above marketing strategies will aid in promoting sales in the highly profitable Consumer segment, hence maximising OS's profits.

Recommendation 3 (Expanding Production):

Lastly, OS can consider varying their production levels. To continue, our team made 2 assumptions. Firstly, the demand will be higher than supply for all products. Thus, any increase in production for each sub-category will lead to increased sales and profits until the point where demand equals supply. Secondly, we assumed that OS has sufficient capital, hence higher production in one sub-category will not lead to decreased production in another sub-category.

With these assumptions, OS can consider increasing the production of the top 3 subcategories with highest profit per unit sold for every quarter (refer to Figure 23), until the supply of these products matches the demand in the market. This will lead to greater sales and profits in each quarter, thus maximising OS's profits overall.

Limitations

Finally, the team would like to acknowledge certain limitations in our analysis and recommendations.

Since there were too many cities included in the data (572 cities), we decided to analyse only up to the state level (Figure 5). The team assumed that in the states that generated negative profits, their cities also generated negative profits.

Also, since there was no information on the demand of the products, we assumed that the demand always exceeds supply when there is profit, whilst supply always exceeds demand when there are losses. Furthermore, we also acknowledge that without sufficient information on the market, it will be difficult for the OS to know exactly when to stop producing in order to hit market equilibrium for each subcategory and fully maximize profits.

Appendix A (Answers to Guiding Questions)

1. In which year did the home office segment register the lowest profit? What was the cumulative profit in that year for the entire business unit?
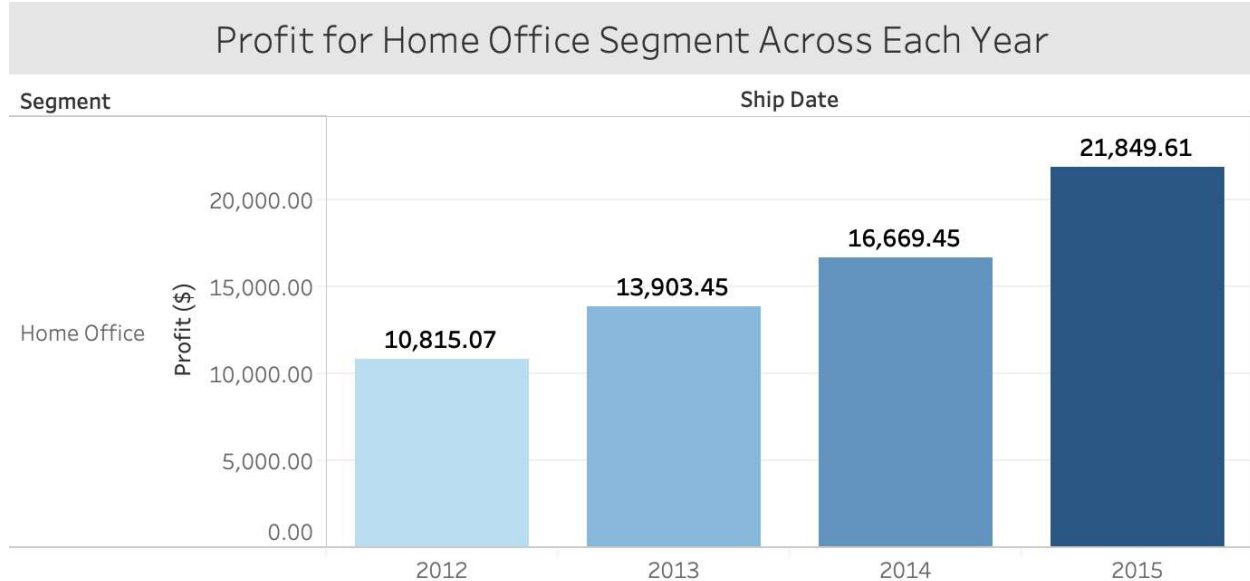

Figure 1: Profit for Home Office Segment Across Each Year

The home office segment registered the lowest profit of $10,815.07 in 2012. In this analysis, profits generated in the year 2016 was omitted as the data only included profit figures for January.

Based on the graph, home office segment has seen an increasing trend over the years. The rate of increase is rather consistent as the profit growth for (2012-2013) is 28.6%, profit growth for (2013-2014) is 19.9% and profit growth for (2014-2015) is 31.1%.

The huge positive increase growth shows that it is definitely a positive segment that will continue to generate profit for the company.

The cause for this general increase in profit of home office segment across the years is due to work being digitized in many sectors. Companies, especially startups, do not need a huge office space to conduct their ordinary day-to-day businesses. They are able to work effectively with a small group of talents in a home setting or essentially a small office. Generally, they do not require high demand of laborers as well as manpower because they depend on coding softwares to automate their mundane workload. The nature of their businesses are also not heavily dependent on manpower, but rather on talent, hence they do not need a huge office space to house many employees. This is made possible solely on the reason that work is being digitized across many sectors. Startups usually depend heavily on IT to create new products that are new and unique to the market. And IT allows them to be creative and make anything possible through their own creativity. Hence, home offices are being increasingly popular because work is getting more and more digitized over the years. People no longer have to travel to offices to work, and

they are able to work from home, or even operate an office at home to house 5-10 employees to start their businesses.

According to businessnewsdaily, the increasing trend of remote working from home is expected to grow for a long period of time because.

Hence, it is expected the year 2016 will see greater profits in the home office segment than year 2015 as well.

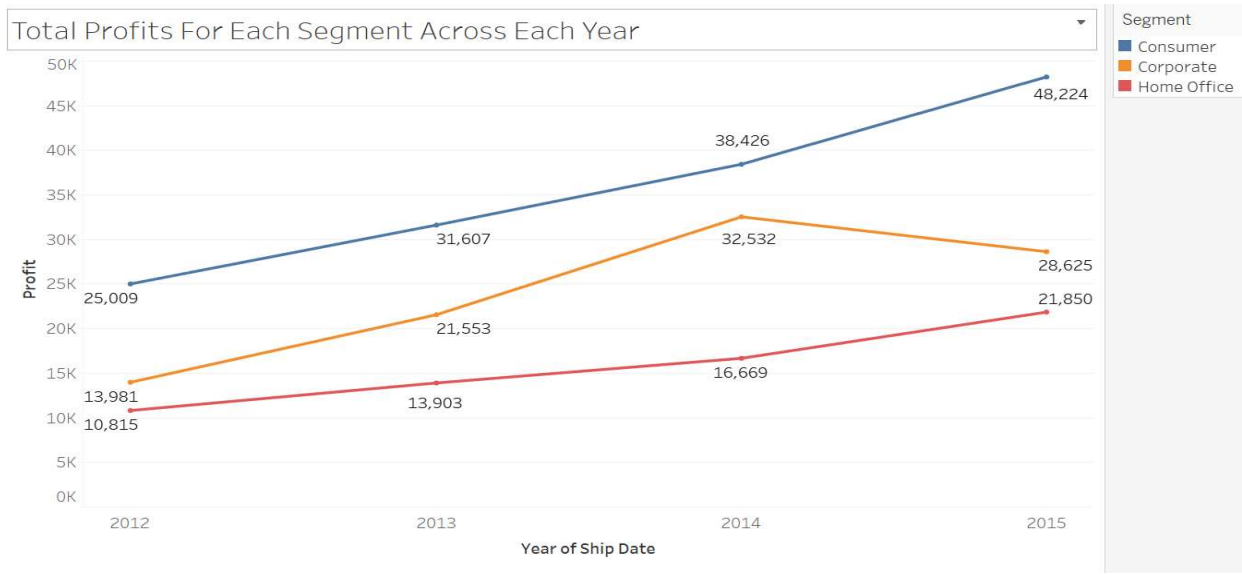**Figure 2: Total Profits for Each Year**

Figure 3: Total Profits For Each Segment For Each Year

The cumulative profit for the entire business unit in 2012 is $49,805.18.
The graph shows an increasing trend in the total profits of the entire business unit from year 2012 to year 2015. The rate of growth however is showing a decreasing trend as the profit increase from (2012 - 2013) is 34.65%, the profit increase from (2013 - 2014) is 30.66% and the profit increase from (2014 - 2015) is 12.63%.

This drastic decrease in increasing profit from (2014 - 2015) is due to the fall in profits in the corporate segment from $32,532 to $28,625. Hence this causes the total increase in profit from 2014 to 2015 in the whole entire business unit to be only 12.63% compared to other years where the business unit has an extremely good average rate of 30% increase.

Profits has fallen from $32,532 for 3,129 units sold in 2014 to $28,625 for 3,870 units sold in 2015. This means that the profits per unit sold has fallen from $10.40 to $7.40. This also means that the profits per unit sold has fallen by $3.

The reason for this fall in profits in the corporate segment is not due to the fall in demand for corporate segment items. This is a combination of increased shipping costs, increased expenses besides shipping costs, and reduced sales per unit sold. The shipping costs per quantity sold in 2014 is $20,373 / 3,129 (Shipping costs / Quantity) = $6.51. The shipping costs per quantity sold in 2015 is $27,326 / 3,870 = $7.06. This increase in shipping costs per unit sold ($7.06 - $6.51 = **$0.55**) is part of the **$3** decrease in profits per unit sold. This, however, is not the sole reason behind this fall in profits.

Another factor would be expenses besides shipping cost such as material costs because even if there is an increase in shipping costs, the sales for 2015 regarding the corporate segment is $252,478, the shipping costs is $27,326, yet the profit is only $28, 625. This means that there are other components regarding expenses such as material costs and others which costs $252,478 - $27,326 - $28,625 = $196,527. The expenses besides shipping costs amounted to a drastic $196,527 in 2015 for the corporate office segment. Dividing these expenses per unit demand for 2015, it would be $196,527 / 3,870 = $50.78. Using the same methodology to find out the

expenses besides shipping costs per unit demand in 2014, it would be $156,388 / 3,129 = $49.98. Hence, this increase in expenses besides shipping costs per unit sold ($50.78 - $49.98 = **$0.80**) is part of the **$3** decrease in profits per unit sold.

The last factor would be reduction in sales per unit sold. In 2014, the sales per unit sold is $209,293 / 3,129 = $66.88. In 2015, the sales per unit sold is $252,478 / 3,870 = $65.24. This decrease in sales per unit sold from 2014 to 2015 ($66.88 - $65.24 = **$1.65**) is the final part of the **$3** decrease in profits per unit sold.

All 3 factors mentioned tally up to $3 decrease in profits per unit sold. Per unit quantity shipped, shipping costs went up by $0.55, expenses besides shipping costs went up by $0.80, sales went down by **$1.65**, thus all amounts to $3 decrease in profits per unit sold.

From this analysis, we can clearly see that the biggest factor for the loss in profit for the corporate office segment would be the decrease of sales per unit sold which contributed to ($1.65/$3 = 55%) hence the company should focus on increasing sales per unit sold first. This can perhaps be done by driving up the demand of the market through marketing campaigns and when there's substantial demand in the market, increase the sales price to match the increased demand for the corporate office segment products.

2. The CEO announced that the business unit will discontinue all subcategories that had a cumulative (all years combined) loss. Which subcategories had cumulative negative profit and how much?

Total Profits For Each Sub-Category

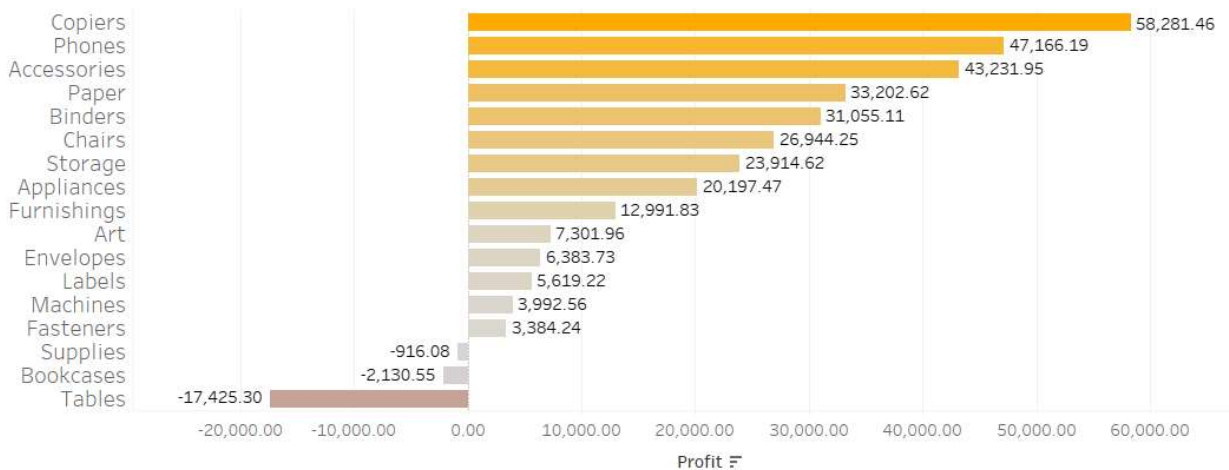| Sub-Category	Profit
Copiers	58,281.46
Phones	47,166.19
Accessories	43,231.95
Paper	33,202.62
Binders	31,055.11
Chairs	26,944.25
Storage	23,914.62
Appliances	20,197.47
Furnishings	12,991.83
Art	7,301.96
Envelopes	6,383.73
Labels	5,619.22
Machines	3,992.56
Fasteners	3,384.24
Supplies	-916.08
Bookcases	-2,130.55
Tables	-17,425.30

Profit =

Figure 4: Total Profits For Each Sub-Category

The subcategories Tables, Bookcases and Supplies had cumulative negative profits. The profit figures are -$17,425.30, -$2,130.03 and -$916.08 respectively. This results to a 6.73% loss in total profits [(916.08+2130.55+17425.30) / 304214] * 100%.

This means that these 3 sub-categories are causing losses to the entire business unit overall, and the production for these units should be reduced so as to prevent further losses in the future. Reasons for these could be because products like tables and bookcases have long shell-life and companies do not generally find the need to keep replacing them. Hence, this drives down the demand, resulting in losses incurred to the business unit.

The sub-category with the highest profit is copiers with $58,281.46, which contributed to 19.2% of the total profits. Items such as copiers, phones and papers constantly need to be replaced by the company. Copiers for example, are always being updated with new models that are faster and more efficient at saving printing costs than older model copiers. Hence companies feel the need to replace copiers once every few years. Copiers do not have long shelf-life as well compared to tables or bookcases because they are less sturdy and generally require maintenance from time to time.

Hence, through this analysis, in our recommendation, it would be more profitable for the Office Suppliers to focus on fueling production on these items like copiers and phones because they are always constantly being replaced. Hence, this will drive a generally high demand for these products, thus increasing sales and maximizing profits for the entire business unit.

3. CEO has called for a detailed business review of country/state/city that yielded cumulative negative profit across all years in the dataset. Which country/state/city will be part of this detailed review?

Figure 5: Total Profits for Each Country

Based on Figure 5, both countries had cumulative positive profit over the years. Therefore, both countries will not be included in the review.
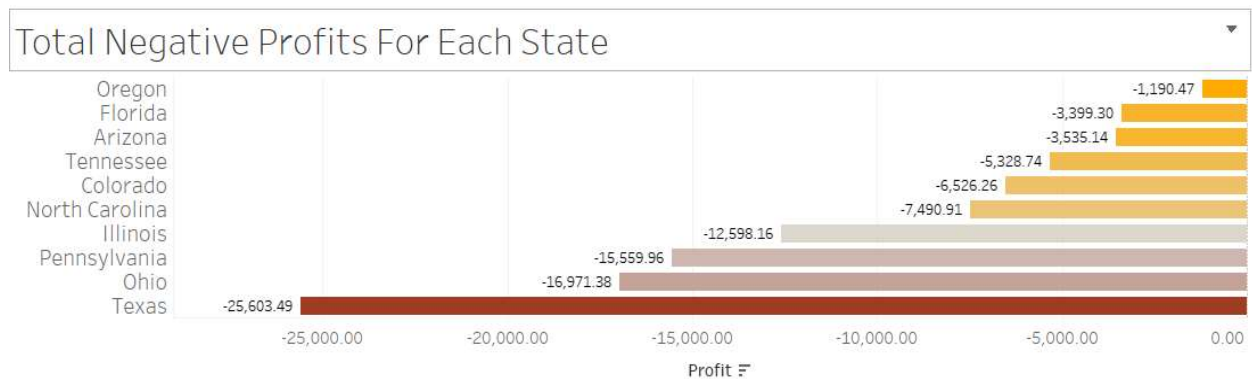

Figure 6: Total Negative Profits for Each State

Based on Figure 6, 10 out of the 57 states that OS ships out to have generated negative cumulative profits. These states are Oregon, Florida, Arizona, Tennessee, Colorado, North Carolina, Illinois, Pennsylvania, Ohio and Texas. In total, the 10 states generated a revenue loss of $98,203.82.
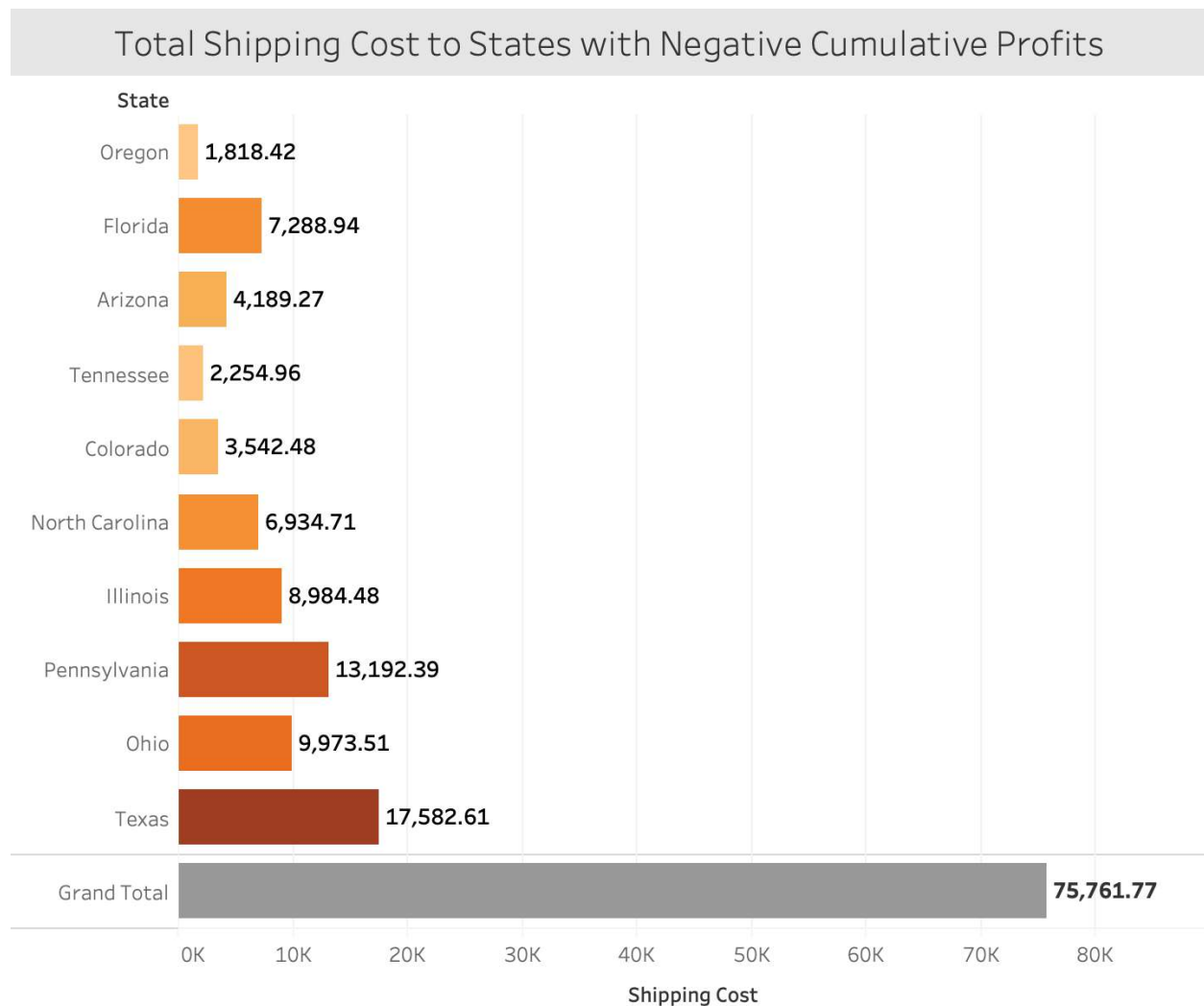
Total Shipping Cost to States with Negative Cumulative Profits

State

State	Shipping Cost
Oregon	1,818.42
Florida	7,288.94
Arizona	4,189.27
Tennessee	2,254.96
Colorado	3,542.48
North Carolina	6,934.71
Illinois	8,984.48
Pennsylvania	13,192.39
Ohio	9,973.51
Texas	17,582.61
Grand Total	75,761.77

Shipping Cost (axis: 0K, 10K, 20K, 30K, 40K, 50K, 60K, 70K, 80K)

Figure 7: Total Shipping Cost to States with Negative Cumulative Profits

Our team also analysed the total shipping costs incurred for shipment to these 10 states, which is $75,761.77. This is 30.7% of the total shipping costs, which adds up to $246,655.41.

This revenue amounts to a loss of 32.3% in the total net profit across the years from 2012 to 2016. The reason for this is due to extremely high shipping costs especially in Texas which has a total costs of $17,582.61. These shipping costs expenses of these 10 states amounted to 30.7% of the whole entire shipping costs for all states.

4. Looking at the aggregate profit figures across all years, is the business profitable? How much was the cumulative profit (all years combined)?

Profit Across the Years

Figure 8: Profit Across the Years

Similar to guiding question 1, in this analysis, the profit that was obtained in the year 2016 was omitted for simplicity as the data only covers for the month of January.

Based on the data, the business is profitable as there was an upward trend in the profit generated from the firm across the year 2012 to 2015. There was an increase in the profit generated of $48,893.43 which is an increase of 98.16% from 2012 to 2015. The cumulative profit earned was $303,195.27.

5. Which product subcategory sold the most in the period of the data provided? What was the total sales in dollar value?
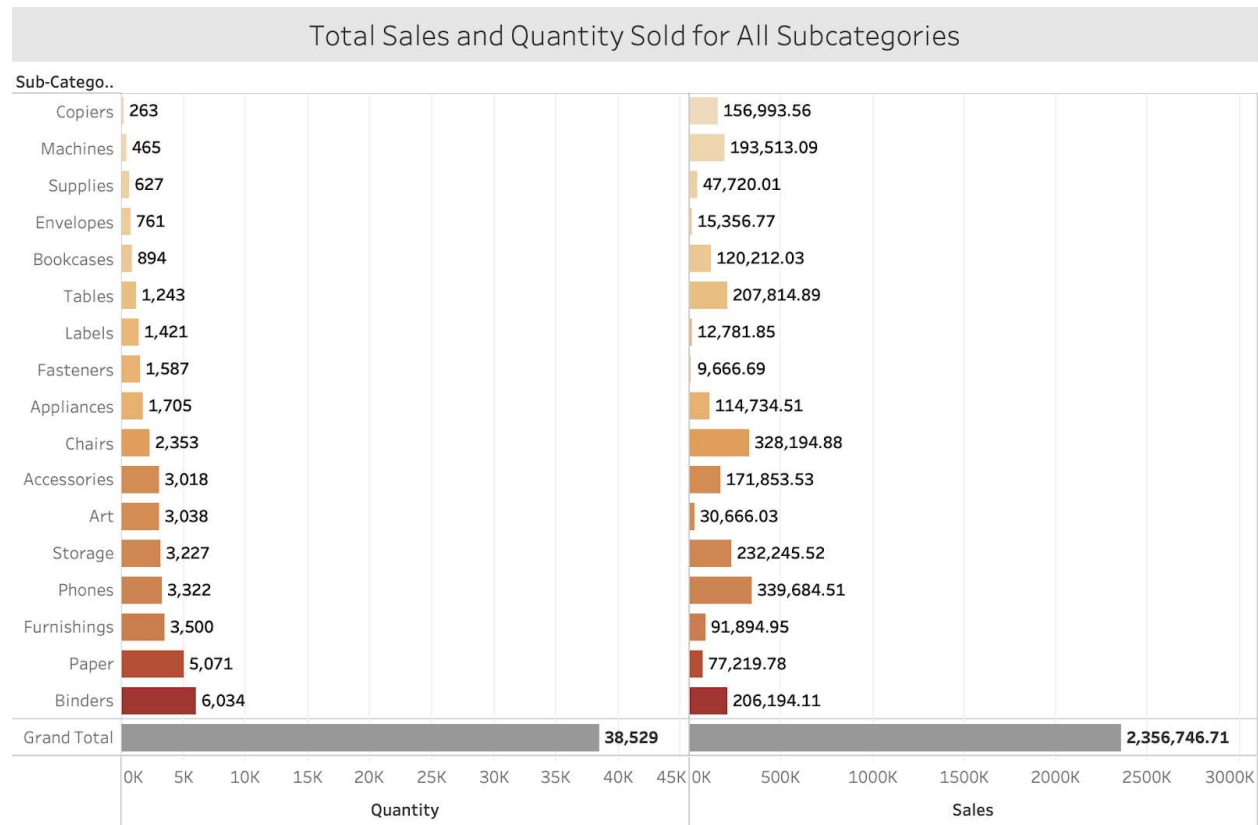

Figure 9: Total Sales and Quantity Sold for All Subcategories

There were a total of 38,529 units that were sold across the different product subcategories during the period. The product subcategory that sold the most in the period is Binders, whereby 6,034 units were sold, amounting to 15.7% of the total number of items sold by OS. Copiers had the lowest amount of quantity sold, with only 263 units sold.

The total sales Binders account for is $120,212.03 which only amounts to 5.1% of the total sales of $2,356,746.71. The product subcategory that has the highest sales is Phones which amounted to $339,684.51. In comparison, Fasteners had the lowest sales at $9,666.69.

6. Which product subcategory was the most profitable in the period of your dataset? How much was the total profit in dollar value?
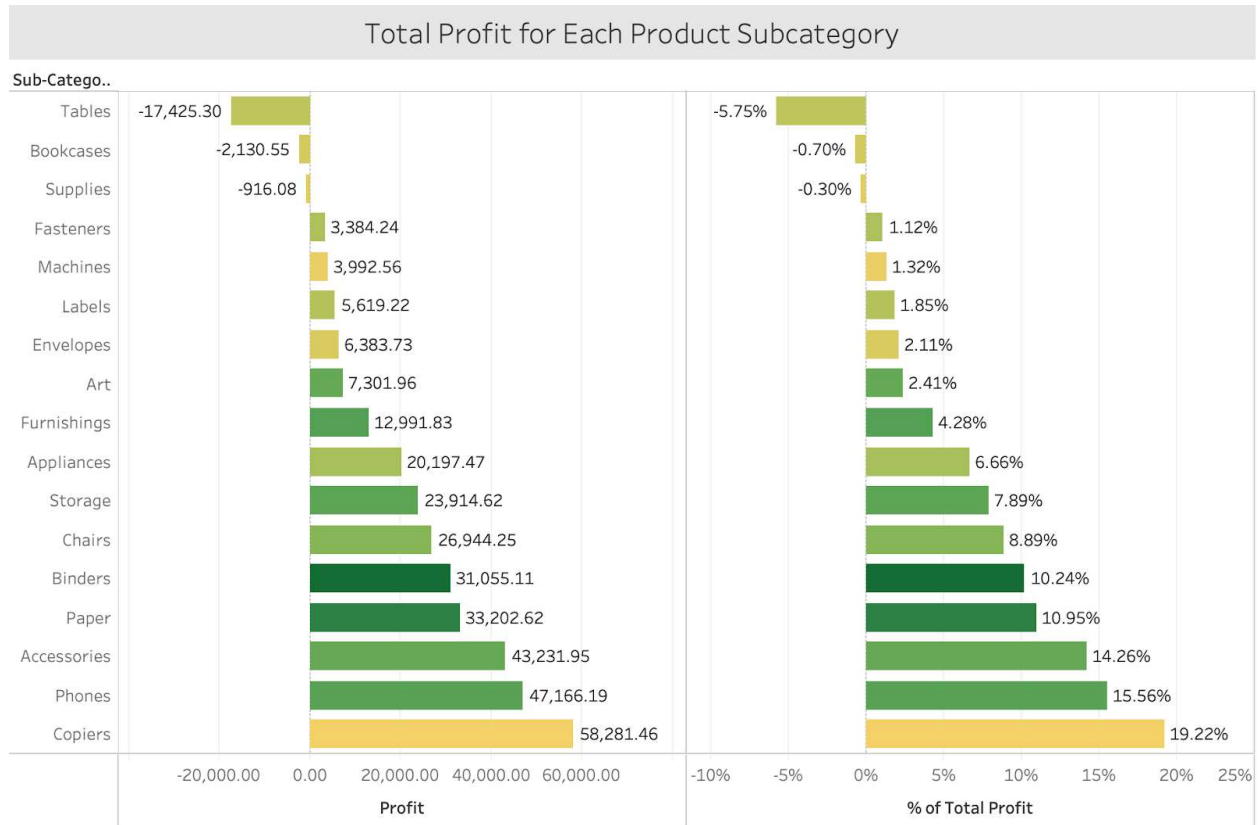

Figure 10: Total Profit for Each Product Subcategory

Based on the data, Copiers generated the highest profit of $58,281.46 contributing to 19.2% of the total profit of $303,195.27. Among the seventeen sub-categories, Tables, Supplies and Bookcases generated a total loss of $17,425.30, $916.08 and $2130.03 respectively contributing to a 6.75% loss to the overall profit.

7. Which product category registered the highest ever monthly sales (in dollar value) in the period of the dataset? How much was the total sales (in dollar value) for that product category in that month?

Figure 11: Total Monthly Sales for Each Product Category

This graph plots the total sales for each month and plots them on the three different lines compared by category.

As we can see, by observing the highest peak, we can see which category had the highest monthly sales figure. The red dot which highlights the peak, shows that office furniture in December has the highest sales figure.

All three categories however have similar performance and sales figures do not differ much from each other. One anomaly would be sales figures for the month of March for Technology which could be looked further into. One possibility would be new technology being released.
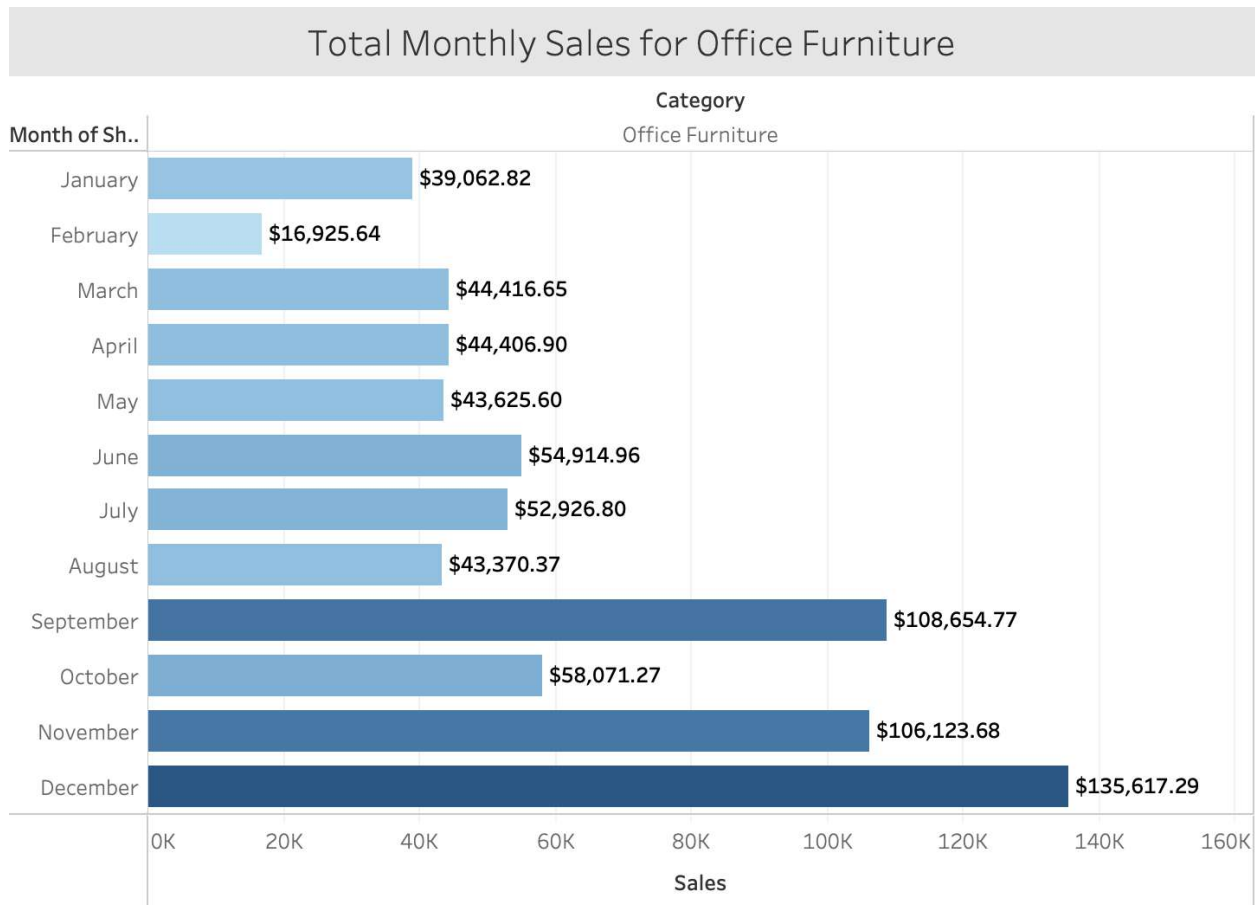
Total Monthly Sales for Office Furniture

Category

Office Furniture

Month of Sh..	Sales
January	$39,062.82
February	$16,925.64
March	$44,416.65
April	$44,406.90
May	$43,625.60
June	$54,914.96
July	$52,926.80
August	$43,370.37
September	$108,654.77
October	$58,071.27
November	$106,123.68
December	$135,617.29

Sales: 0K 20K 40K 60K 80K 100K 120K 140K 160K

Figure 12: Total Monthly Sales for Office Furniture Category

By filtering the category to only obtain sales figures from Office Furniture, we can look closely at how much sales amounted to Office Furniture for each month. As we can see, December has the highest sales of $135,617.29.

This can be attributed to offices changing their furniture in preparation of the new year leading to higher sales in the last few months.

We can also observe that February has abnormally low sales of only $16,925.64, which we have to further look into to understand what caused the low figures.

8. A year is divided into 4 quarters with 3 months in each quarter. Q1 has Jan, Feb, Mar, Q2 has Apr, May, Jun and so on. In which quarter does the store sell the most (in $) and how much? In that quarter, which subcategory had the most sales ($) and how much?
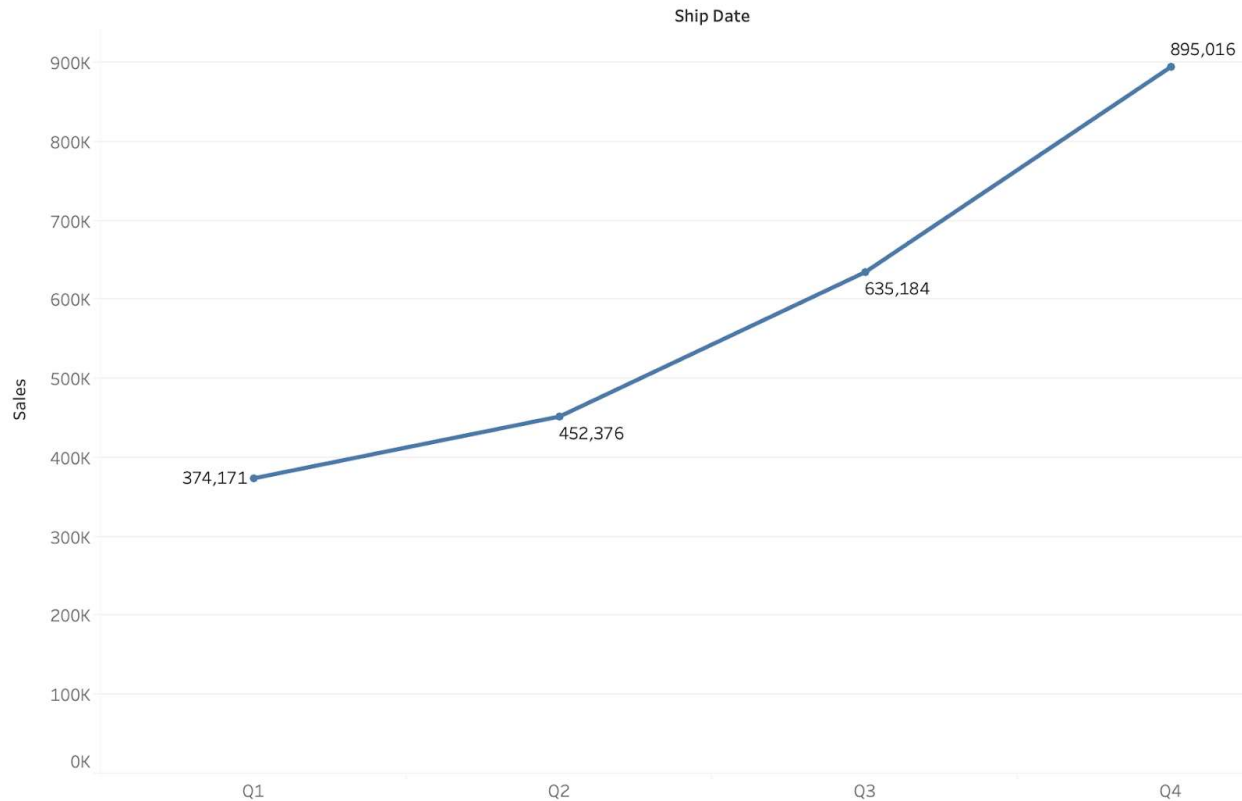
Sum of sales

Figure 13: Sum of Sales for Each Quarter

To find out the quarter with the highest sales, we first plotted the sum of sales against each quarter. This graph adds the total amount of sales for each quarter for the different years (2012,2013,2014,2015) and sums it up, then proceeds to compare it by the different quarters.

From this we can see that quarter 4 has the highest sales of $895,015.88, with Quarter 1 having the lowest sales of 374,170.91. To further understand the reason for the high sales in Quarter 4, we will look at the graph below to analyze the sales figures for each sub category.

The high total sales in the fourth quarter suggest we could brainstorm for a better production and marketing strategy in order to further increase profits and save costs.

One reason for such high sales in the last quarter could be the replacement of old furniture or changing to improved office equipment for the next year.
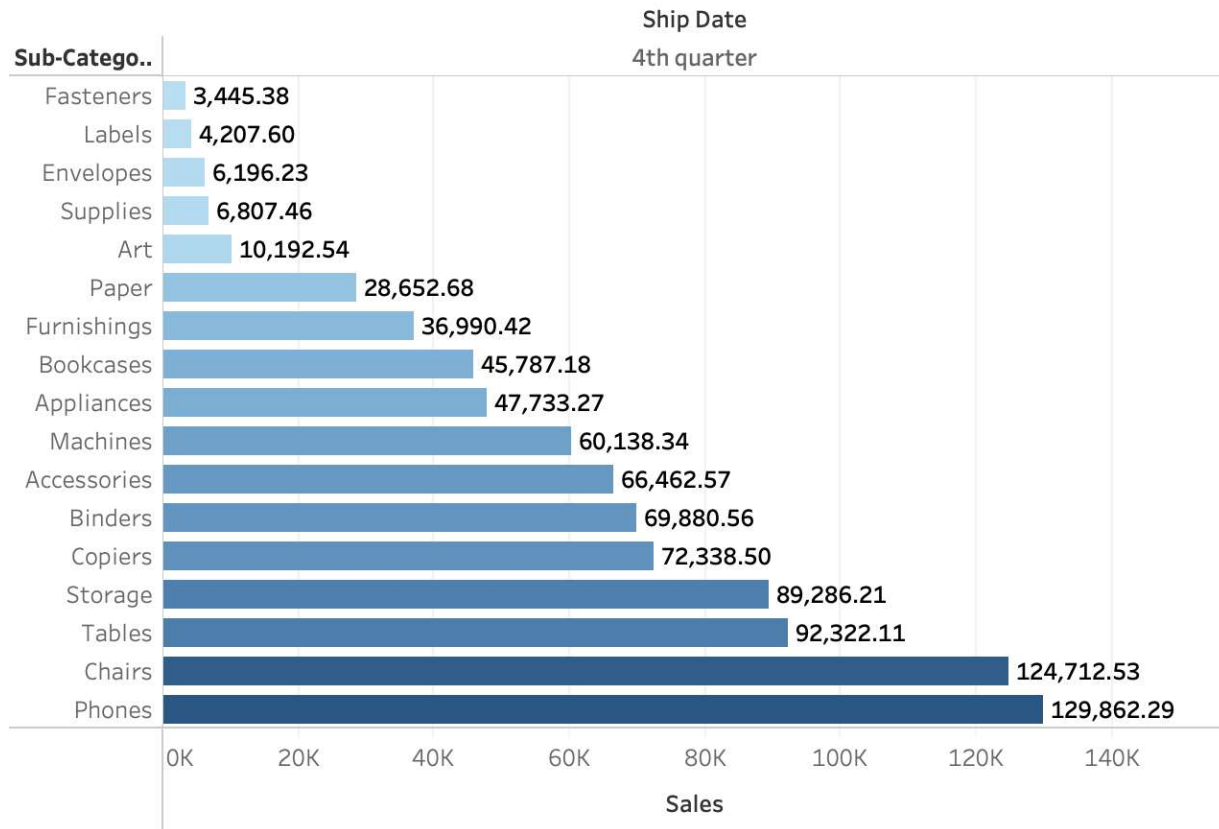
Figure 14: Total Sales for Each Product Subcategory in Quarter 4

This graph plots the total sales of each subcategory and compares them with each other. The data is filtered to only obtain sales figures from Quarter 4.

As we can see, the subcategory responsible for the highest sales figure is Phones with a total sales of $129,862.29, followed by Chairs, which is only slightly behind at $124,712.53 sales.

Art, Envelopes, Fasteners, Labels and Supplies are the 5 subcategories with the lowest sales for the company in Quarter 4. Fasteners has the lowest sales at $3,445.38.

9. Calculate the cumulate profit (in $) for each subcategory across all years. Remove or exclude all the subcategories that had a cumulative negative profit across all years. After removal, what is the total profit of the OS business unit across all years?

Total Cumulative Profit for All Sub-categories

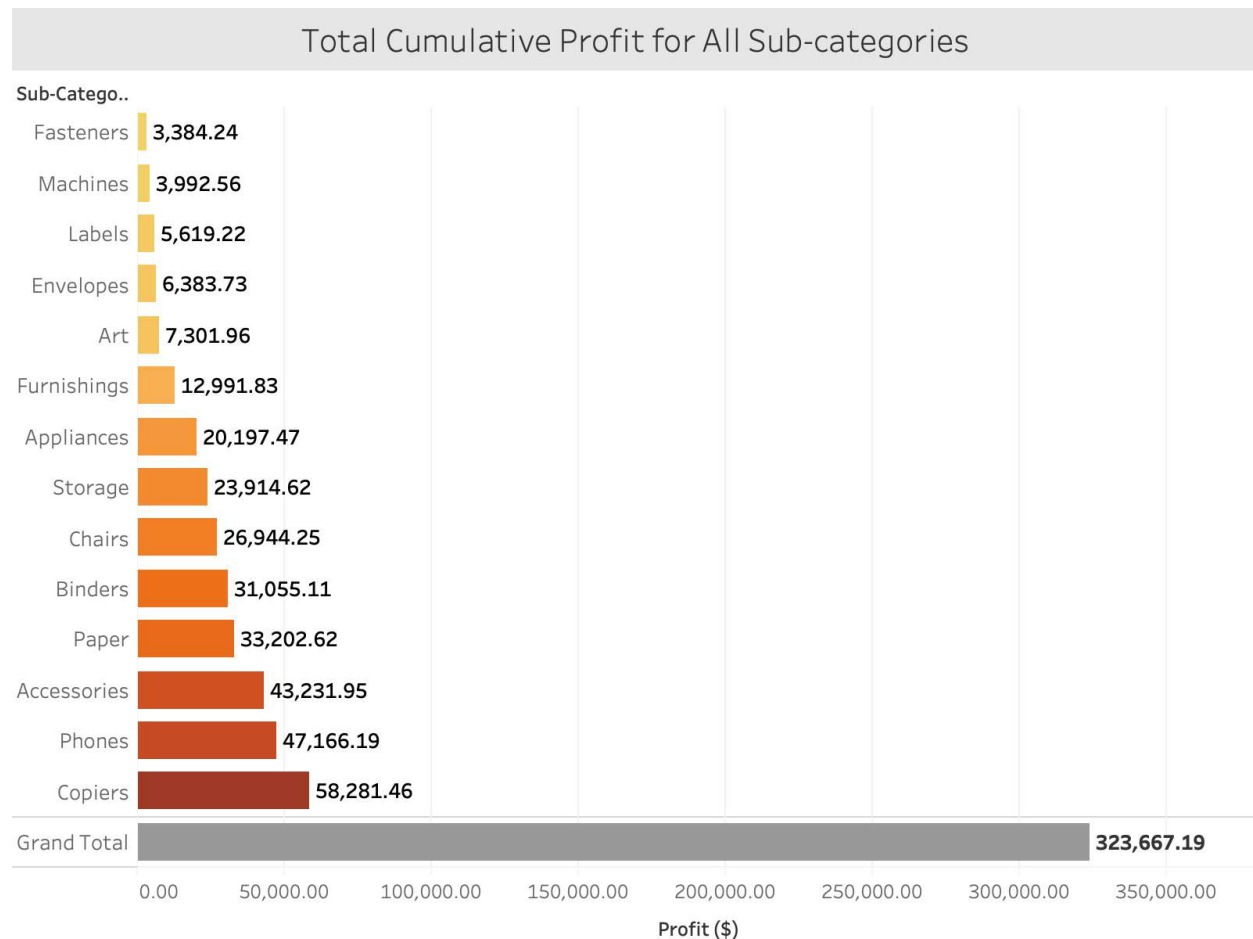| Sub-Catego..	Profit ($)
Fasteners	3,384.24
Machines	3,992.56
Labels	5,619.22
Envelopes	6,383.73
Art	7,301.96
Furnishings	12,991.83
Appliances	20,197.47
Storage	23,914.62
Chairs	26,944.25
Binders	31,055.11
Paper	33,202.62
Accessories	43,231.95
Phones	47,166.19
Copiers	58,281.46
Grand Total	323,667.19

Figure 15: Total Cumulative Profit for All Subcategories

This chart shows the cumulative profit for each sub-category across the years. The last bar shows the total profit. In this analysis, sub-categories that had a cumulative negative profit - Bookcases, Supplies and Tables - were removed to examine the potential profit generated when these subcategories are discontinued.

Based on Figure 10, the total profit of OS (North America) across all years was $303,195.27, including Bookcases, Supplies and Tables which contributed losses of $2,130.55, $916.08 and $17,425.30 respectively.

However based on Figure 15, total profit increases by 6.75% to $323,667.19 if Bookcases, Supplies and Tables are removed.

10. If only sales in the month of December were considered for analysis, which product sub- category within the office supplies category sold the most quantity cumulatively across all years? How much was it?
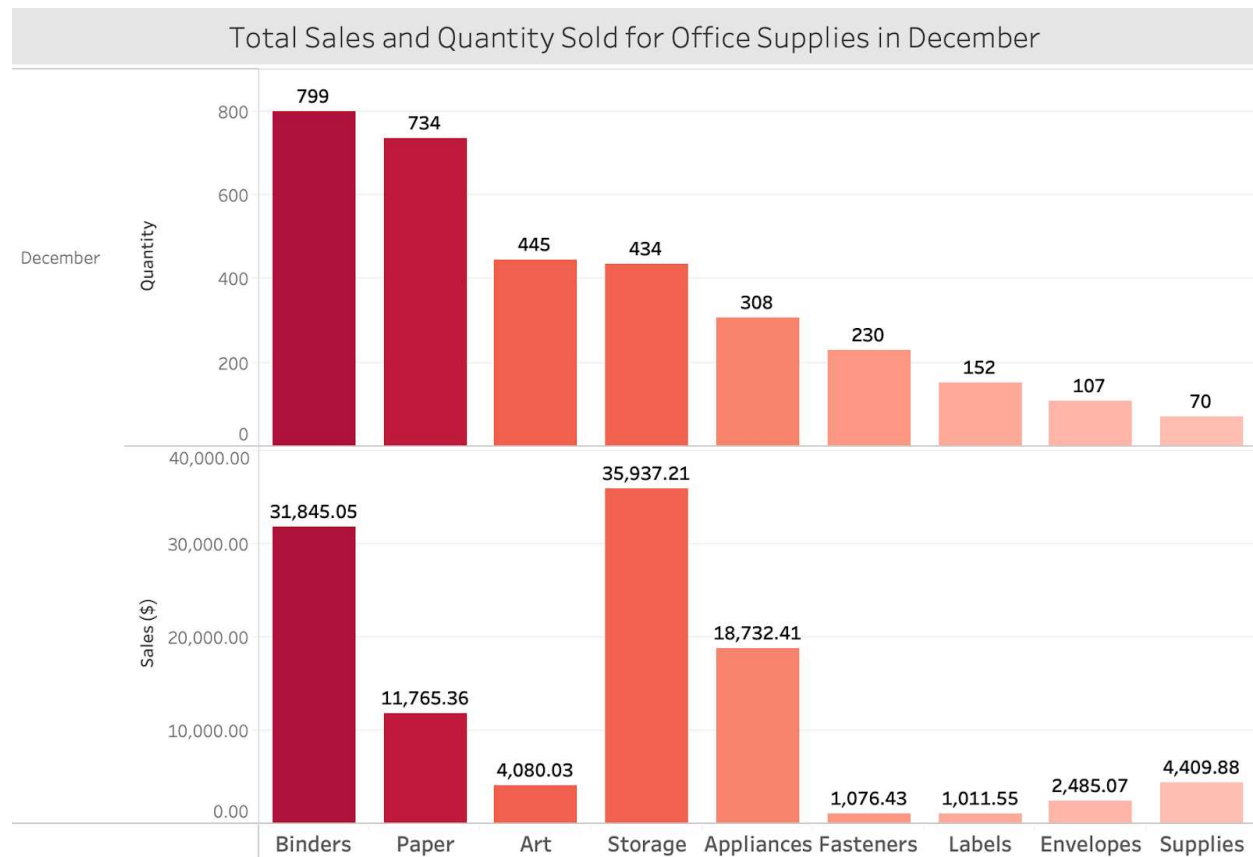

Figure 16: Total Sales and Quantity Sold for Office Supplies Segment in December

This graph shows the cumulative sales and quantity sold for each product sub-category under the office supplies category across years 2012-2015, for the month of December only. We can use this to analyse the demand for each type of office supplies in December.

Based on Figure 16, the product sub-category that sold the most in terms of quantity was Binders, with a total of 799 units sold and $31,845.05 worth of sales generated. Thus the demand for binders is the highest in the month of December.

Other than Binders, Paper and Art supplies were also high in demand, with 734 units and 445 units sold respectively.

The large demand for Paper and Art supplies may be due to the occurence of Christmas and Thanksgiving in December, therefore consumers purchase large amounts of paper to write cards or letters to celebrate the festive season. Meanwhile, high demand for binders can be attributed to the purchasing of supplies in preparation for the new year. For example, office workers purchase binders to organise their documents for the upcoming year.

Based on these observations, OS can consider organising a year-end sale for Binders, Paper and Storage supplies. Since these products have the highest demand, a sale would be likely to attract a larger group of consumers, thus promoting higher sales.

11. What percentage of the total profit (across all years) was contributed by the top three most selling sub-categories?
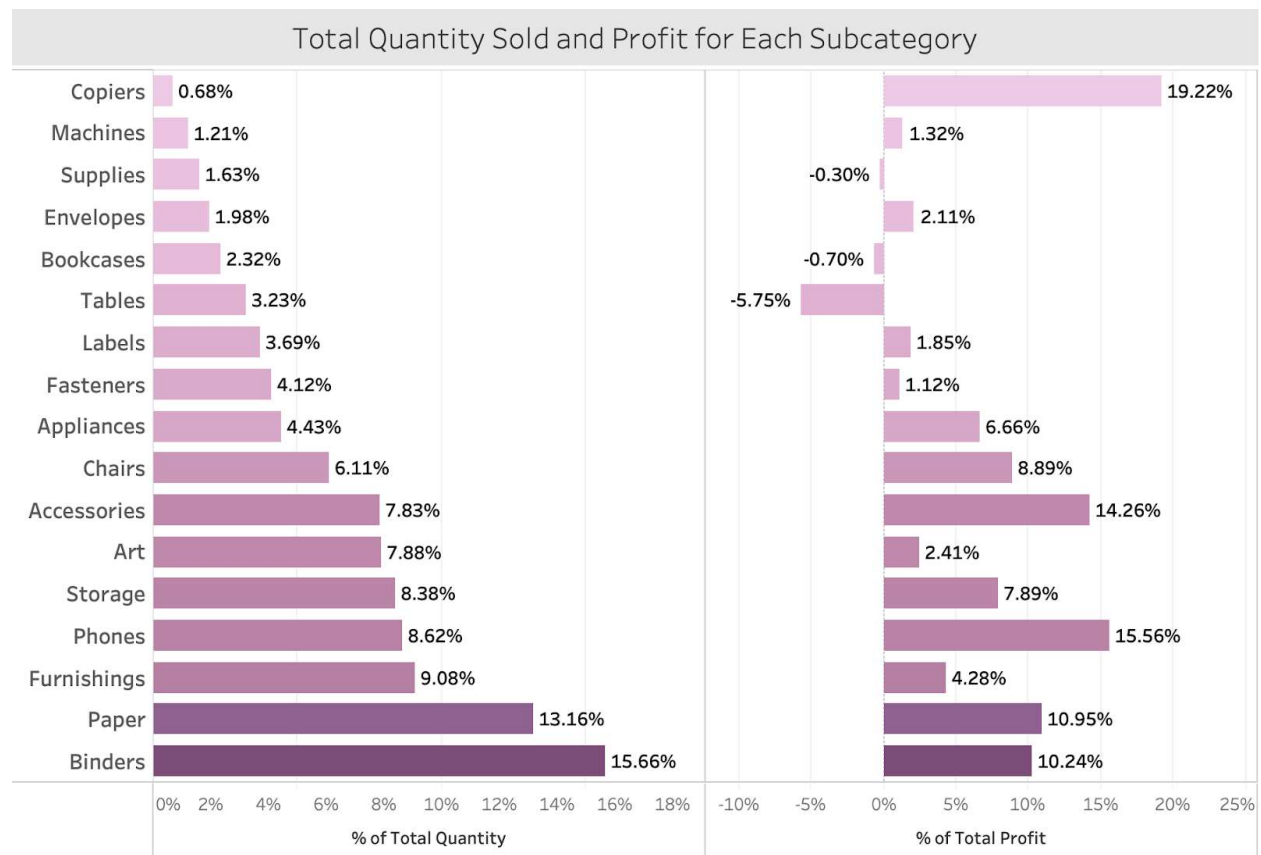

Figure 17: Total Quantity Sold and Profit for Each Subcategory

Figure 17 shows a comparison between the percentage of total quantity sold and amount of profit generated for each subcategory. Profit figures are shown as a percentage of total profit from 2012 to 2015.

Based on this figure, the top three most selling sub-categories in descending order are Binders, Paper and Furnishing, accounting for 37.9% (=15.66% +13.16% +9.08%) of total quantity sold. However, the total sales for these three subcategories only made up 25.47% (=10.24% +10.95% +4.28%) of overall sales. Here we observe that although Binders, Paper and Furnishing accounted for more than a third of total quantity sold, they only generated about a quarter of total profit.

Meanwhile, as seen in the graph, while Copiers had the lowest quantity sold, it also had the largest profit percentage, making up 19.22% of total profit. Phones and Accessories generated the second and third-highest profits, making up 15.56% and 14.26% of total profit respectively. None of these 3 subcategories were top-selling in terms of quantity. This shows that there is little correlation between quantity sold and profit earned.

12. Examine the profit ratio (Profit Ratio = Profit/Sales) of the OS business unit across all years in the dataset.
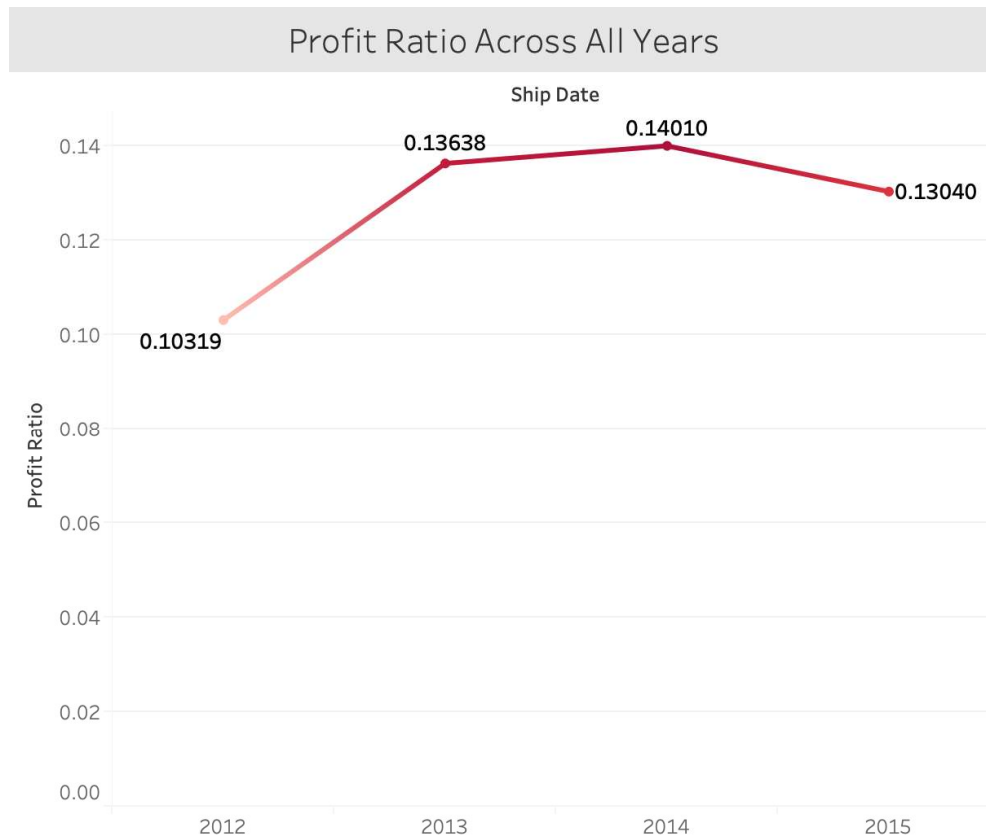

Figure 18: Profit Ratio Across All Years

This graph illustrates the profit ratio of the OS business unit across years 2012 to 2015. In 2012, the profit margin was the lowest at 0.10319. From 2012 to 2014, there was an increasing trend in the profit margin, peaking at 0.14010. In 2015, profit margin decreased to 0.13040. We will analyse possible reasons for this decrease in the next section. In general, after 2012, OS has managed to maintain a profit ratio of 0.13 and above.
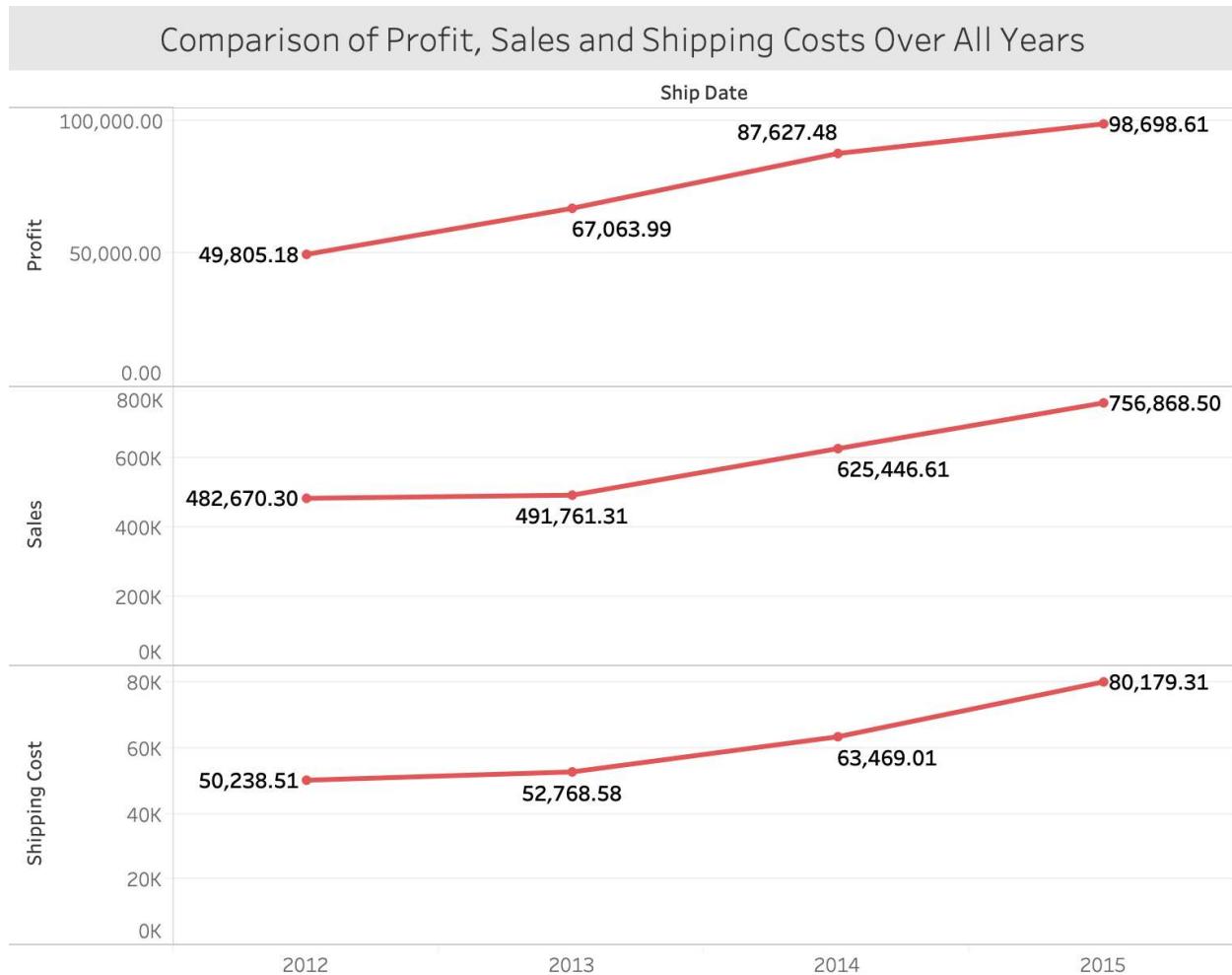
Figure 19: Comparison of Profit, Sales and Shipping Costs Across All Years

Figure 19 shows a comparison of the profit, sales, and shipping costs figures from 2012 to 2015.

Based on Figure 19, from 2014 to 2015, sales increased by 21.01% while profit only increased by 12.63%. Since Profit Ratio = Profit/Sales, profit margin decreased. This implies that the company's financial performance has deteriorated as a lower percentage of sales is converted to profits.

A possible underlying reason for this issue may be the increasing shipping costs over the years, as seen in the graph. In particular, shipping costs recorded its highest increase of 26.33% in 2015. Since Profits = Revenue - Costs, as costs increase, profits decrease. Therefore, OS can consider reducing its shipping costs in order to increase their profit margin.

13. How much cumulative profit (all years) did the five subcategories with maximum sales (in $) contribute? What are those subcategories?
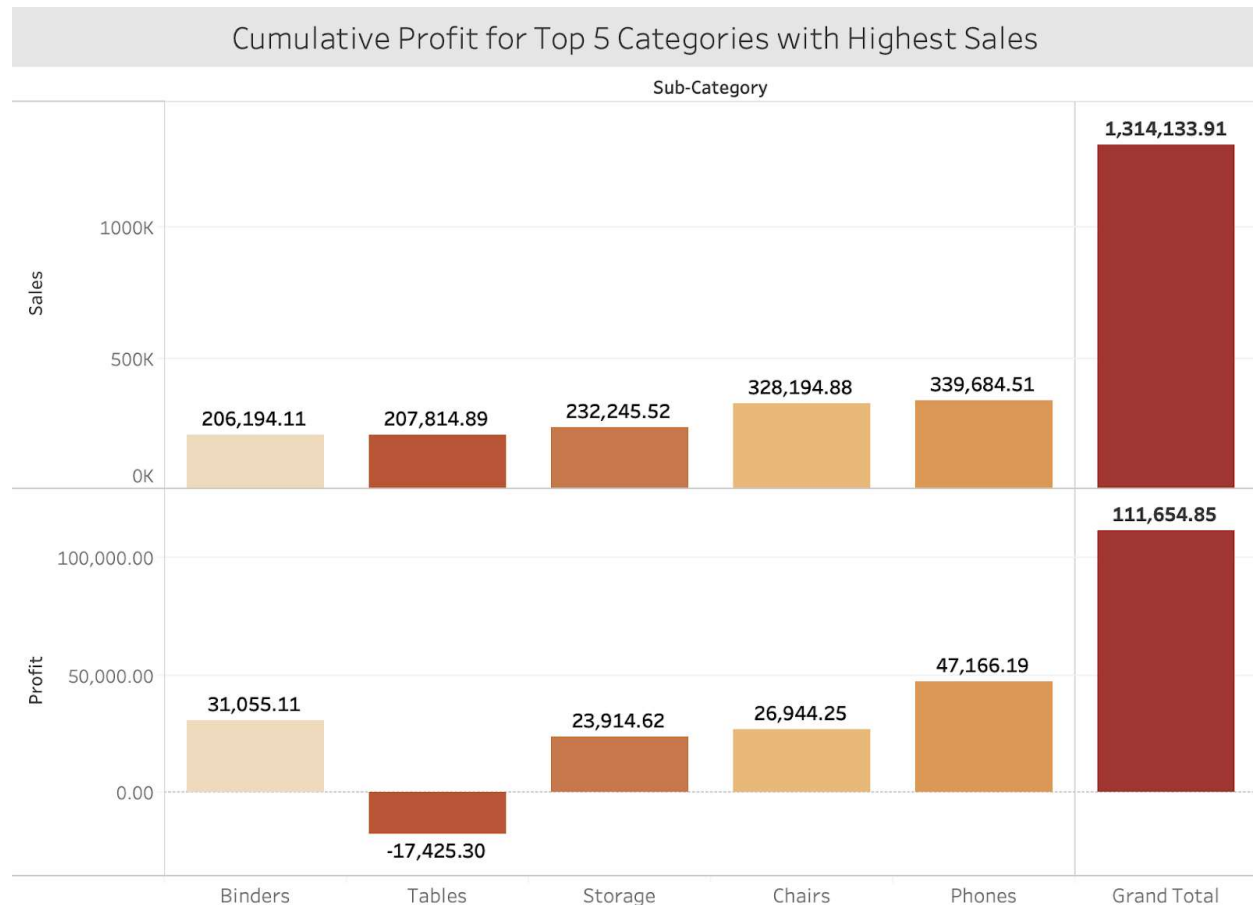

Figure 20: Cumulative Profit for Top 5 Categories with Highest Sales

The top five sub-categories with maximum sales in ascending order are Binders, Tables, Storage, Chairs and Phones. In total, they generated $1,314,133.91 worth of sales, which was then translated into a cumulative profit of $111,654.85 across 2012 to 2015. Here, we should note that despite being one of the Top 5 in terms of sales, Tables generated a cumulative loss in profit of $17,425.30. This may be due to high costs of production, which offsetted gains from sales. Thus, OS can consider discontinuing sale of tables, or find a way to either reduce the costs of production or promote even greater sales.

Appendix B (Additional Analysis)

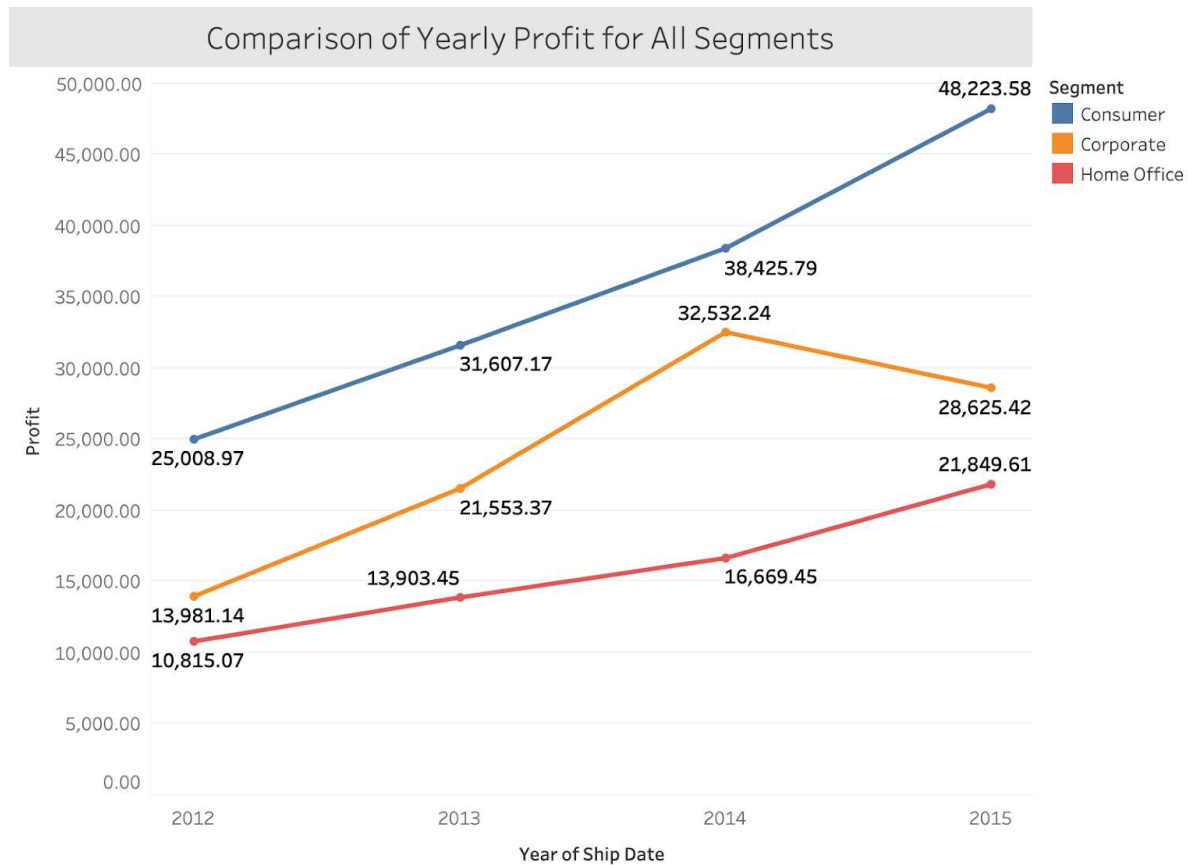**Analysis of Yearly Profit Across All Market Segments**

Figure 21: Comparison of Yearly Profits for All Segments (Same as Figure 3)

Looking at Guiding Question 1, the team decided to further analyse the trends for the yearly profits of all 3 market segments.

Profit for the Consumer segment increased throughout all years, reaching a peak of $48,223.58 in 2015. There was a 92.8% increase from 2012 to 2015.

Profit for the Home Office segment also had an increasing trend throughout, peaking at $21,849.61. There was a 102.0% increase from 2012 to 2015.

Profit for the Corporate segment had a different trend. From 2012-2014, its profit increased at the highest rate, reaching a 132.7% rise from 2012 in the year 2014. However in 2015, profit decreased by $3906.82.

In general, this graph shows that the Consumer segment produced the highest profits throughout all four years, followed by the Corporate segment, then the Home Office segment. This might be

due to the much larger population of individual consumers as compared to the number of corporations and home offices. Hence demand for office supplies for personal use is much higher than the demand of supplies for office use. Then, a possible reason for the Corporate segment spending more than the Home Office segment may be that corporations have a higher spending budget since they need to cater more supplies for the larger number of employees.

From this analysis, OS can consider carrying out more marketing strategies targeting the highly profitable Consumer segment. It is also relatively easier to market to individual consumers as they are more likely to be active online, so OS can consider digital marketing. Consumers are also more likely to be influenced by advertising strategies compared to the other two segments. This is because while corporations and home offices usually purchase a certain number of supplies that they deem enough for all employees, individual consumers have no limit to the number of products that they can purchase. If OS can successfully convince them that other products are also worth spending on, then our sales will increase.

Analysis of Profit Per Unit Sold for Each Subcategory
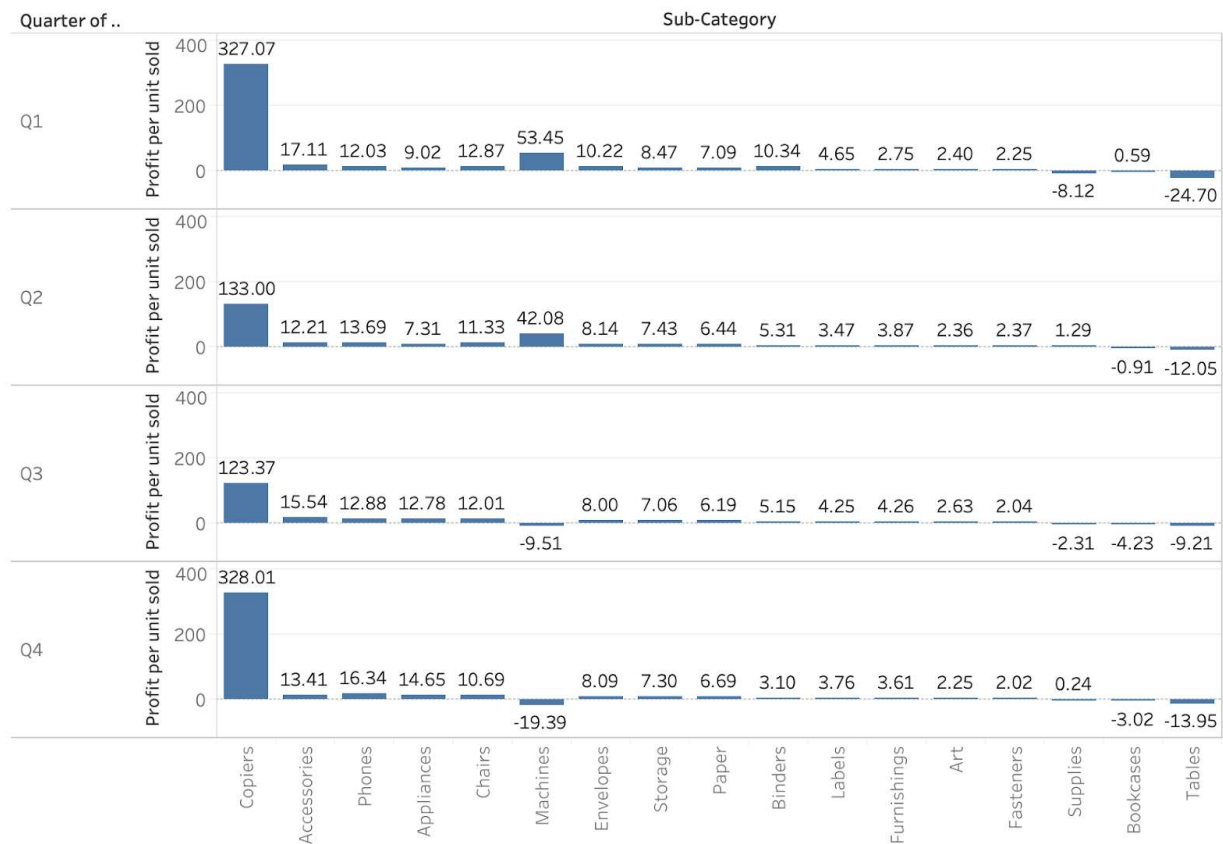
Profit per unit sold (quarter)

Figure 22: Profit Per Unit Sold for Each Subcategory in Each Quarter

This graph shows the profit per unit sold for each product subcategory, in each quarter of the year. This analysis will show us what are the products with higher and lower profitability, and hence determine how we can vary the production levels for different quarters of the year.

Based on Figure 22, we have come up with a summary of the categories with the highest and lowest/negative profit per unit sold, as shown below.

Quarter	Highest Profit Per Unit Sold	Lowest/Negative Profit Per Unit Sold
1	Copiers, Machines, Accessories	Tables, Supplies, Bookcases
2	Copiers, Machines, Phones	Tables, Supplies, Bookcases
3	Copiers, Accessories, Phones	Machines, Tables, Supplies, Bookcases
4	Copiers, Phones, Appliances	Machines, Tables, Bookcases

Figure 23: Summary of Subcategories with Highest and Lowest Profit per unit

In general, Copiers have the highest profit per unit sold throughout the year, while Tables and Bookcases have the lowest. OS needs to allocate their resources in the most efficient way possible in order to maximise profits earned. Using the information in the table, we can determine which products can OS consider expanding production for (left column), since they are the most highly profitable. This is assuming OS has sufficient capital, and hence they can allocate more resources to the production of these goods.

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